inel news
idaho national engineering laboratory
December 4, 1979

Is INEL drinking water really safe?

Recent news stories about disposal of wastes in the Snake River Plain aquifer may have some INEL employees wondering — is INEL water safe?

In a few words, Site drinking water meets Idaho, DOE, and EPA (Environmental Protection Agency) standards and is safe to drink.

Very small amounts of radioactivity in large volumes of water are discharged via disposal ponds at TRA. The water eventually seeps downward to the Snake River Plain Aquifer. At CPP, similar low level radioactive liquids are discharged via a disposal well into the aquifer.

The aquifer flows to the southwest. For nearly 30 years, USGS and Radiological and Environmental Sciences Laboratory (RESL) personnel have monitored the aquifer. Samples are taken monthly from production wells at all INEL operating areas — TRA, CPP, NRF, CFA, RWMC, TAN, PBF, ARA, and ANL-W. The monitoring program shows that water from these wells is safe to drink.

Water samples are drawn periodically from about 130 wells, both on and off Site. Offsite water samples show no contaminants distinguishable from natural radioactivity.

These and other facts about INEL waste management practices have been thoroughly documented, made public, and widely disseminated for many years. In addition, a thorough discussion of INEL waste management since 1949 is contained in a document (ERDA-1536) published in 1977 following public hearings that year in Boise and Idaho Falls. Each year RESL distributes to state and federal agencies and the public a comprehensive environmental monitoring report. Other quarterly reports are routinely distributed to state and federal agencies.

Environmental contaminants will lessen in time due to three factors:

- lower amounts of contaminants are being discharged from INEL plants;
- contaminants are losing their radioactivity (decaying) as they move slowly in the aquifer;
- contaminants become even more diluted by dispersion and also are adsorbed onto soil and rock particles in the aquifer.

The monthly samples taken at the INEL operating areas continue to show that Site drinking water meets or beats both the EPA and the Idaho regulations for community water supplies: "Man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 mrem per year." That standard assumes an individual consumes two liters (about two quarts) of water every day for a year.

The drinking water closest to the EPA standard above is from the wells at CFA. A CFA employee receives less than 3 mrem per year from tritium in the water consumed during working hours at the Site, or about the same dose received on one transcontinental airflight.

Chromium compounds once used as corrosion inhibitors in reactor cooling towers are no longer injected into the aquifer. No traces of this chemical are found in INEL drinking water.

The aquifer beneath INEL is one of the most completely monitored, thoroughly understood and effectively controlled water resources in the country.INEL employees can be more sure of site drinking water quality than can most industrial employees in the United states.

And the bottom line is encouraging. Despite the known small impact on the water, site engineers are trying to decrease even further or completely eliminate discharges of potentially hazardous waste materials to the aquifer.

That's because the Department of Energy and its contractors subscribe to the ALARA/ALAP philosophy about potential exposures to radioactivity. That policy prescribes that levels should be "as low as reasonably achieveable," or "as low as practicable."

RODGER JENSEN, a U.S. Geological Survey hydrologist, takes a water sample from one of approximately 130 wells within and outside the INEL boundary.

LOFT runs first small pipe break test

The third in a series of nuclear tests in the LOFT reactor was conducted November 20 and preliminary data indicated all went as planned.

The test (L3-1) simulated the events which would follow a small break in a pipe supplying cooling water to the nuclear reactor core in a larger commercial reactor. The experiment began with the opening of a valve, simulating a small pipe break. The size of the LOFT "break" was two-thirds of an inch, representing about a four-inch break in a commercial reactor.

At the initiation of the break, the nuclear chain reaction was stopped by the insertion of control rods into the core, and the primary coolant pumps were turned off. Steam and water were discharged slowly through the break to a tank where the steam was condensed. In response to the changes in the system's pressure, emergency core cooling (ECC) systems were activated. Throughout the experiment, which lasted about two hours, instruments recorded water levels, pressures, fuel-rod temperatures and coolant flow rates.

This test represents the first of a series of small break tests, with the LOFT reactor at power, to be conducted at the INEL during the next year. These "small break" experiments were moved up in sequence of tests planned for the LOFT reactor in response to the accident at Three Mile Island and the successful results of large break LOFT tests performed earlier this year.

"As late as last June, this test was scheduled for May, 1981," says Nick Kaufman, LOFT director, "but as a result of the TMI accident, was ad-

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vanced about a year and a half. I'd like to publicly acknowledge the personnel of DOE-ID, the Nuclear Regulatory Commission and EG&G Idaho for their tremendous efforts in meeting this stepped-up schedule."

While only preliminary data is available, it appears that the instruments worked well and a lot of good information was obtained. The ECC systems worked as designed and prevented the reactor core from becoming uncovered. Engineers observed the reactor vessel level fall initially, due to the break, and then recover because of the action of the ECC. Extensive analysis of the test, including detailed comparisons with computer model predictions, will continue for several months.

TOM POINTER, LOFT facility manager, keeps an eye on the monitors as the test gets under way.

Benson named EEO specialist

Janet K. Benson has been named equal employment opportunity specialist in ENICO's Employee Relations Department.

She held a similar position, EEO representative, with Aerojet Nuclear in 1974-75 and has served as employee representative job analyst with ACC/ENICO since 1975.

In her new position, she will provide direction to ENICO's EEO/AA programs, including recommendations for new and expanded programs, monitoring continuing goals and commitments and reporting on activities within the company. She also will participate in the Exxon Recruitment Program as an ENICO representative and will serve as contact and coordinator for local minority groups.

To be more available to employees and supervisors on the subject of equal employment and affirmative action, Benson will be at the Chemical Plant each Wednesday. She may be contacted in E.B.Tycz' office or by phone Wednesdays at 6-3532.

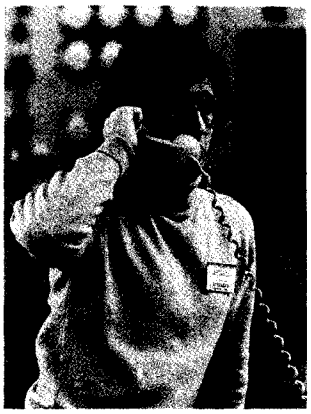
Janet Benson

The 50 megawatt thermal LOFT reactor is the largest facility in the NRC's program of confirmatory research designed to study the effectiveness of systems intended to provide emergency core cooling for light water-cooled reactors in the event of a pipe break accident. Information gained from the LOFT tests will aid understanding of instrumentation and operation of commercial reactors. Data from experiments in this research program are being used to help predict the performance of ECC systems in large reactors and increase the NRC's ability to confirm independently the margins of safety that have been estimated during licensing reviews.

Austrian, Dutch, Finnish, German, Japanese and Swedish scientists, on assignment to the INEL, observed the experiment and will assist in the detailed analysis of the test.

In addition, the United States and foreign scientific attention is focused on the experiment because the NRC designated the test a "standard problem." This means that reactor safety engineers throughout the U.S. and many foreign countries will predict the reactor's behavior, using their own computer codes (after being given the conditions existing in the facility at the initiation of the simulated small pipe break). These predictions will be compared later with the actual test results to determine how well the various codes performed.

Nuclear tests in LOFT are expected to continue with a variety of pipe break sizes and locations and other types of accidents.



RON BEELMAN, LOFT shift supervisor, keeps things moving during the test.

MIKE PETERS, test section supervisor, checks the data coming in while testing is in progress.

ENICO fund drive termed success

"Congratulations are in order to all ENICO employees for their participation in the 1979 United Way Campaign," says Roger Egan, campaign chairman.

A total of $28,392 (including the company's gift) was given in this year's effort. "This equates to a per capita employee gift of $29.65, up 42 per cent over 1978," Egan says. "It also means the average employee gave $39.50, with individual participation of 73 per cent, up 20 per cent from last year."

With the campaign now 97 per cent complete, funds will be distributed to the three community United Way organizations involved — Idaho Falls/Bonneville County, Blackfoot and Pocatello. Any cards still outstanding should be returned this week, according to Egan.

A.I.Ch.E. to meet Dec. 7

Dr. R.R. Furgason, academic vice president of the University of Idaho, will speak on "The Economic Forces Associated with Energy Use in the Future," at the December 7 meeting of the Idaho Section of the American Institute of Chemical Engineers.

The meeting will be at the Towne House in Idaho Falls with a social hour beginning at 6:30 p.m. and dinner at 7:15. The program is scheduled to start at 8.

ENERGY MANAGEMENT

EG&G Idaho, Inc

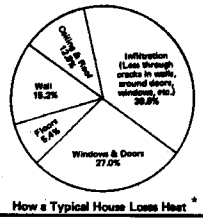
Energy tip

A recent study of 50 homes was conducted by the Texas Power and Light Company to determine how heat is lost in homes.

The study has revealed that up to 39.6% of heating and cooling costs in the average home results from air leaking into the home through cracks in walls, around doors, windows, etc.

The EG&G Energy Management Section suggests that similar patterns of air leakage will probably be found in all homes. Of that 39.6%, about half of the air leaks in from two rather unexpected sources: (1) wall outlets (sockets) and wall switches, and (2) under the sole plate. Thirteen per cent of the air infiltration comes in around windows and another 13% from the duct system, sliding glass doors, fire place, vented hoods, etc. Exterior doors and dryer vents account for another 24% of air leaking into the home that you're paying for. Surprisingly, recessed lighting accounts for 5% of the total.

Weatherizing your home by caulking, painting, and sealing up cracks around doors, windows, and walls where air leaks in is perhaps your most cost-effective method of reducing energy costs. You can do this yourself and generally will only spend 3-4 hours to complete the job.



How a Typical House Loses Heat